

Affordance of landscapes and economic socio-spatial networks in the Quinchao archipelago, Chile: a contribution to landscape research and island studies.

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ABSTRACT: This article presents research which analyzes landscape transformation, using an interdisciplinary approach embedded in an archipelagic context. The investigation unfolds in Quinchao, a cluster of ten islands of the Quinchao Department, Chiloé archipelago, Región de Los Lagos, Chile. The investigation gathers reflections from such disciplines as anthropology, geography, biology and psychology which share similar reflections on the configuration of landscapes as an affordance or enabled property of the human-in-ecosystem assemblage. Ethnographic interpretations and Social Network Analysis of fieldwork data are used to propose a theoretical framework for the investigation of coastal and marine landscapes in archipelagic contexts.

Keywords: archipelago, affordance, Chiloé, dwelling, island studies, landscapes, Quinchao, socio-ecological system

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Introduction: Global-local intersections and island studies

In recent years, some debate has emerged around the idea of ‘archipelagic thinking’ in island studies scholarship. Island studies, or nissology (Baldacchino, 2008; Depraetere, 1991), has advocated an inquiry into islands “on their own terms” (McCall, 1994, p. 6) and, regardless of the rich philosophical and political contributions it has made, debates on the nature of islands and island life, colonialism and other related topics have not quite been able to efficiently address theoretical and methodological challenges that we were warned about by Baldacchino (2008). Archipelagos are still problematic in island studies, and they challenge some of the conventional dichotomies within nissology (e.g. sea and land, island and mainland, island and

continent) whilst exploring how living between and among islands requires an alternative kind of cultural geography (Stratford, Baldacchino, McMahon, Farbotko & Harwood, 2011). Other authors are studying geographical and historical features of archipelagos and their role in the configuration of islandness (Depraetere, 2008a), how archipelagos and their adjacent water are assembled through human activities (Hayward, 2012a), or if archipelagic thinking can relate to a re-conceptualization of culture and a denaturalization of space as suggested by the 'spatial turn' experimented in different social sciences (Pugh, 2013). Other voices have argued that there are many fault lines within island studies, so many that it may even be questionable to refer to islandness. Pete Hay believes that the most important void is whether islands are associated with resilience or vulnerability, i.e., what is their condition in a context of global-local interactions and transformation (Hay, 2006). Through this and other arguments, Hay questions the idea of a nissology as the study of islands on their own terms, asserting rather that this is another continentally-derived paradigm (albeit recognizing the viability of a phenomenology of place as a frame for nissology and for overcoming some of its fault lines).

We contribute to this discussion, particularly by critiquing the results of ethnographic research that has clarified what we believe are fundamental dimensions of archipelago thinking and nissology: framing a theoretical discussion of relevant interdisciplinary approaches, with methodological implications for island studies. Our work is also a modest contribution to an ongoing ethnography on Chilean southern islands, a potentially prominent research field with academic and practical implications. Our investigation concentrates on the Quinchao archipelago system (QAS), *Región de los Lagos*, Chile, located between 73°12' to 73°32' W longitude and 42°21' to 42°40' S latitude, and formed by a group of ten islands: Quinchao, Lin Lin, Llingua, Meulín, Quenac, Teuquelin, Cahuach, Alao, Apiao and Chaulinec. QAS has a land surface area of 160.7 km² and 61% of its 8,976 inhabitants live as a rural population. One of the peculiarities of QAS is the coexistence of different kinds of actors and activities unfolding over a common space (mainly agriculture, fisheries, seaweed collection, retail trade and a young aquaculture industry).

The outcomes presented in this article are the result of research conducted between 2012 and 2014 in the QAS. Our investigation hopes to elucidate different landscapes emerging from the relationships between actors, resources, activities and mobility in Quinchao, considering the salmon aquaculture industry and the small scale fishery co-management institution of Management and Exploitation Areas of Benthic Resources (MEABRs). The methodology used is mainly qualitative, using non-statistical approaches, even when quantitative information was used for representing structural properties of inhabitants' economic activities and their spatial mobility. Gathering information on primary sources was conducted by via direct observation, semi-structured in-depth interviews with 16 key informants, and surveys with relational and attributive questions addressed to 162 local residents. Analysis was performed by constructing categorical systems for qualitative information and by a Social Network Analysis (SNA) for relational-quantitative data. In this way, a strategy was conceived for characterizing economic and ecological models, as well as to identify and analyze emergent socio-ecological landscapes. Qualitative data analysis was performed using grounded theory (Glaser & Strauss 1967; Strauss & Corbin, 2002) and computer-aided analysis, with the use of ATLAS.ti software (Muhr, 1991).

Very broadly, social networks are understood as a set of actors (called nodes) related by different types of linkages or ties (Scott, 2000). The SNA was conducted to identifying economic and socio-spatial relationships between islanders and islands of the archipelago, aiming to get a clear picture of mobility trends, and both economic and power relationships in

this socio-spatial network of connectivity and human interaction. The graphic representation of networks was performed using UCINET and NETDRAW software (Borgatti, Everett & Freeman, 2002), and for this quantitative approach we have considered each island of the archipelago as a Socio-Spatial Unit (SSU), except for the main island (also called Quinchao) which was divided into two SSU: the capital (Achao) and the southern part of the island which features much more rural livelihood characteristics (named just as the island and the archipelago, i.e. Quinchao). As SNA uses mathematics and topology for its performance, both attributive and relational questions were asked (Scott, 2000). In this way, a bi-modal matrix was obtained, characterized by having different types of actors in rows (in this case, the 162 inhabitants surveyed) and columns (16 SSU, eleven of which correspond to Quinchao's islands, while the remaining five are nearby villages and cities). The matrix design can be summarized as a matrix X where $x_{ij} = 0$ if resident 'i' declares not to have relations with the SSU 'j' ; $x_{ij} = 1$ if 'i' declares a buying relationship with 'j' (if resident i goes to j to buy something); $x_{ij} = 2$ if 'i' declares a selling relationship with 'j' (if i goes to j to sell something); and $x_{ij} = 3$ if 'i' declares a relationship of both buying from and selling to 'j'.

Here, we present some of results of our research. More importantly for the readers of this journal, we use these results to propose a theoretical framework for landscape research in multi-island contexts. Hence, we will not dwell too long on the hypothesis and the methodological aspects of the investigation, and instead emphasis will be placed on the ethnographical and theoretical results relevant to nissology and archipelago research. First, we provide a brief account of some of the main features of the Quinchao archipelago using historical information and the results of our ethnographic observation, interviews and social network analysis. Then, we explain the theoretical conclusions outlined from the interpretation of fieldwork data to re-engage with discussions that concern island studies and possible links with other interdisciplinary inquiries.

Case study: ethnographic notes of the Quinchao archipelago

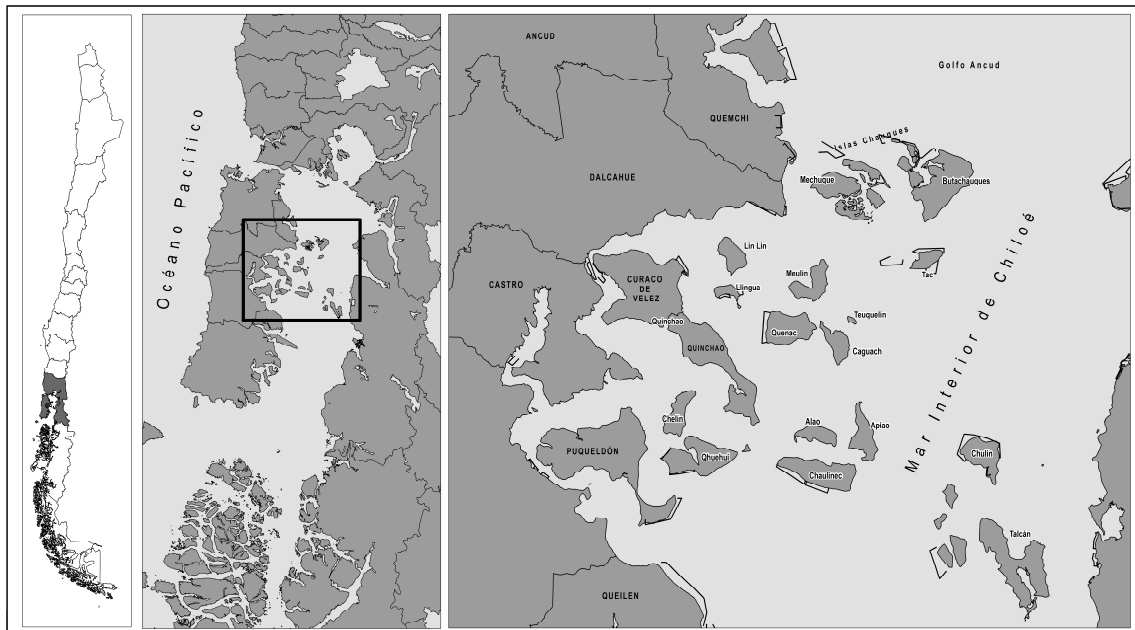
Globalization, the internationalization of economic and cultural patterns (Comas, 1998), has become a familiar concept used to analyze and understand a wide range of social phenomena. Its importance has increased due to what David Harvey (2001, p. 288) has called the “spatial fix”, or the constant creation of new territorial re-appropriations while deploying its socio-cultural and economic-ecological expansion. These processes do not unfold in similar ways in different spatial fields because there are biological and political factors that tend to concentrate them in specific territories. Put differently, some spaces for the allocation of modernizing/capitalist agents and social dynamics are more attractive than others. If we also take into account the importance of local culture, we get a picture of globalization with different socio-spatial characteristics.

Chile represents an extraordinary example of such global-local multidimensional intersections, considering its rich and diverse natural capital and its primary exporting economy (Fazio, 1998). In particular, the southern region of the country has experienced some violent transformations related to the exploitation of marine and coastal resources, increasing the velocity and depth of transformations derived from the coexistence of actors with different rationalities, and projects and actions in a common environment. In this scenario, the introduction and consolidation of a salmon aquaculture industry since the late nineties has had a significant impact on the appropriations of marine and coastal resources (Bañados & Alvial, 2006; Maggi, 2004; Montero, 2004; Rebolledo, 2012; Saavedra, 2011).

The *Región de Los Lagos* is a Chilean sociopolitical division, located between 40°13' and 44°3' S latitude and between 74°49' to 71°34' W longitude (Figure 1). One of the country's peculiarities is that, in the south, the Chilean central valley plunges, ushering in a vast territory dominated by an overwhelming number of islands of varying sizes, fjords and channels, through which thousands of years ago ancient dwellers managed to move and live, resisting the rainy, cold and gray weather. The archipelago of Chiloé is located on the southern part of the *Región de los Lagos*, and is formed by the big island of Chiloé and over forty nearby smaller islands. Inhabited by 154,766 persons and with a total land surface area of 9,181 km² (INE, 2007), the archipelago of Chiloé features environmental, sociocultural and historical particularities that distinguish it from the rest of Chile and its continental territory. For example, the region has a western slope facing the Pacific Ocean and another eastern slope that, together with the Chilean continental platform, configures an inland sea. It is in the latter area that an anthropic and sociocultural presence has developed from around 6,000 years ago, through a combination of farming, fishing and harvesting terrestrial and marine resources (Hucke-Gaete, Álvarez, Navarro, Ruiz, Lo Moro & Farías, 2010). Archeological investigations suggest human settlements in the northern Chilean Patagonian territory between 5,000 and 6,500 BP (Alvarez, 2004), and for the southern area, 7,000 BP (Alvarez, Munita, Fredes and Mera, 2008). According to Munita (2007), these first inhabitants showed deep knowledge and an efficient handling of the middle and late Holocene coastal environment. The case of the Chiloé archipelago is part of this scenario, documented through shell middens associated with pre-Columbian canoeist cultures. There is also archaeological and ethnographic evidence of tidal fishing traps made of wood and stone (Álvarez et al., 2008), indicating a cultural adaptation to coastal environments that required direct knowledge of such factors as tidal cycles and wildlife behaviour. Subsequently, semi-sedentary settlement agricultural groups (around 600 years BP), began to expand the economic-ecological repertoire of Chiloé's inhabitants, incorporating horticulture and livestock activities.

The Spanish colonial era marks a significant shift in Chiloé's livelihood strategies. The foundation of the town of Santiago de Castro in 1567 responded to the need to establish an urban centre for strategic political and cultural operations, as a way to institutionalize the colonial authority of the Spanish crown (Moreno, 2011). Circulating Jesuit missions were a clear example of this, since they would have used Santiago de Castro as their hub in their forays of evangelization (Moreno, 2011; Ther, 2011). Torrejón, Cisternas, Alvial & Torres (2011) argue that the first Spanish settlers tried to implement an economic model that combined mining and agro-livestock activities; but, by the 17th century, the impossibility of this project was quite evident. This produced a change in the livelihood strategy, prioritizing forestry exploitation of larch (*Fitzroya cupressoides*) and cypress (*Pilgerodendron uviferum*) trees. For the first time, Chiloé's inhabitants became dependent on an export-driven economic model (much like a plantation economy). By the 19th century, an economic culture of intensive forestry exploitation was in place, mainly to cater for the demands of northern Chilean vineyards and Peruvian railway infrastructure (Ther, 2011). The forest larch area of the region was reduced from 617,000 hectares in 1550 to an estimated 256,000 hectares in the year 1997 (Torrejón et al., 2011). Agriculture, livestock and small scale fisheries were maintained until the 20th century as part of domestic subsistence.

Figure 1: Map of Chile, Chiloé archipelago, and Quinchao Archipelago.



Source: Zamir Bugeño, based on Albers, C. (2012): GIS Layers, UTM wgs 84, Ya19s.

However, in the same century, some significant changes were imminent, increasing the global-local intersections for our archipelago system.

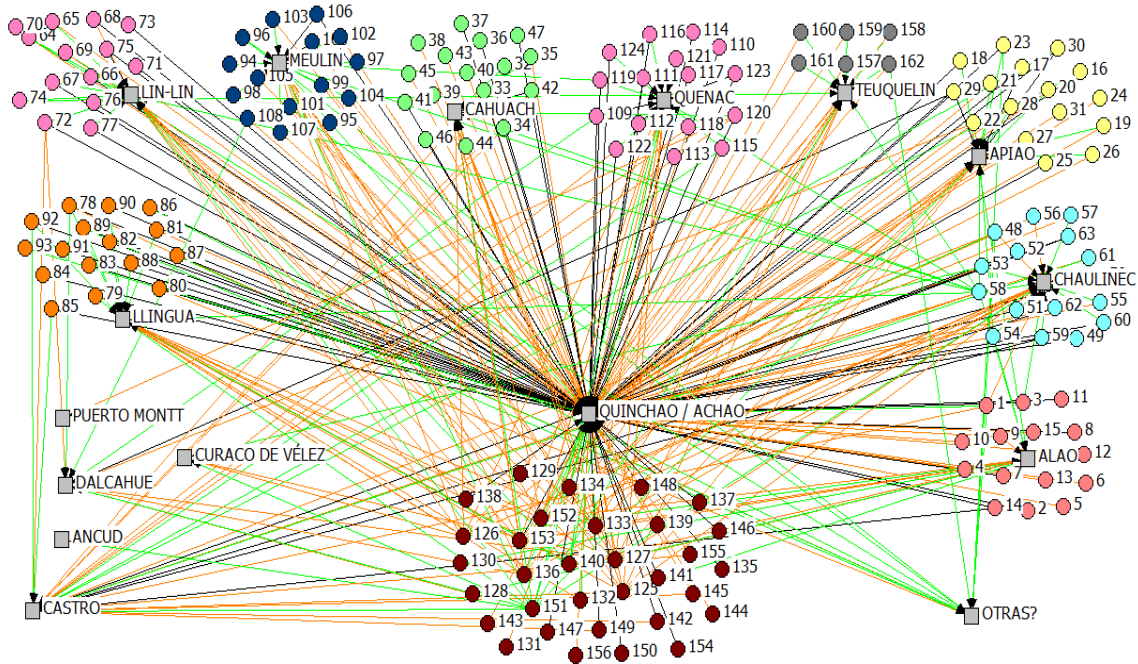
The current scenario began taking shape about four decades ago, when demand for the international food industry increased. The process would later configure a regional economy with structural coherence (Harvey, 2007) or a regional economic cluster (Porter, 1998). This is what has happened in southern Chile, since the flourishing salmon aquaculture industry concentrated its exploitation of *Salmo salar* and *Oncorhynchus mikiss* in Chiloé's inland sea. According to the Chilean National Fishery Service (SERNAPESCA), the *Región de Los Lagos* and the *Región de Aysén* by themselves account for over 82% of aquaculture centres listed in the National Register of Aquaculture. In the region, these firms are involved in the different stages of production of the species (suppliers of eggs and juveniles, fattening centres, processing plants and food suppliers) with other companies that provide other services, such as capital goods (cages and equipment) and other services (research, transportation, consulting) (Montero, 2004). Bañados and Alvial (2006) divide this industry into four historical periods: (i) 1960-1973, the *learning* period; (ii) 1975-1995, the *growing* period; (iii) 1995-2002, the *internationalization* period; and (iv) from 2002, the *consolidation* period. This is, however, not a complete picture: in 2007, this sector was hit by the infectious salmon anemia virus that threatened all economic activities. As the aquaculture industry was by then intricately linked to the socio-economic lives of Chiloé's inhabitants, the accelerated decline of the salmon industry in just one year severely affected the daily lives of many of Chiloé's inhabitants. Recent evidence shows that the rationality of aquaculture economics jeopardized its own sustainability (Buschmann, Riquelme, Hernández-González, Varela, Jiménez, Henríquez, Vergara, Guíñez & Filún, 2006) and threatened the existence of the small-scale peasant economy (Amtmann & Blanco, 2001), among other social and environmental consequences.

As stated earlier, the Quinchao Archipelago System (QAS) is a sub-archipelago of Chiloé formed by a group of ten islands: Quinchao, Lin Lin, Llingua, Meulín, Quenac, Teuquelín, Cahuach, Alao, Apiao and Chaulinec. Current economic activities that dominate in Quinchao are education, trade, construction, fishery, aquaculture, seaweed recollection and agriculture. Sea-related activities still form the basis of many livelihood strategies at the household level, and acquires different levels of complementarity with agricultural activities depending on the city or island where is practiced. Despite not having official records about it, ethnographic registers suggest that in all islands (excluding Quinchao) farming was limited to growing potatoes, wheat and small greenhouses, whilst animal husbandry depends mostly of sheep, swine and poultry.

Technological capital and connectivity are key dimensions to understand archipelagic livelihoods here, as only the commune capital Achao (located in Quinchao island) has the necessary institutions to supply basic services' provisioning. Achao developed rapidly as part of a strategy to promote rural tourism and provide conditions to visitors, particularly lodging, restaurants and banking. But life in the rest of the islands is very different from the urban life of Achao. Getting to and from Achao is strongly influenced by weather conditions and the availability of suitable vessels to cover the route. Although nestled in an inland sea, protected from strong ocean currents, weather conditions in winter tend to keep the port of Achao closed and mobilization is prohibited for most boats, especially for the state-subsidized vessel used by most of the QAS islanders. This makes winter a season of isolation that deprives inhabitants of the minor islands from accessing groceries and other goods and services from Achao. In addition, most of the islands do not have electricity services, so individually each family tries to raise money to obtain and run electric generators, albeit this depends on the amount of fuel that they have been able to bring from Achao and also if climate conditions allows inter island mobility. For water demands, most islands uses rainwater collected in tanks via a gravity system, whilst on Lin Lin, islanders use motor generators for water distribution; only Achao has piped drinking water. Also, in all the islands bar one (small Teuquelín) there are schools with basic education coverage and clinics for basic health care; these health stations are often unable to handle serious cases or diseases, so mobilization in emergencies is performed by a speedboat to Achao's hospital; while access to secondary education can only be covered if students move to bigger and nearby cities like Achao, Dalcahue and Castro.

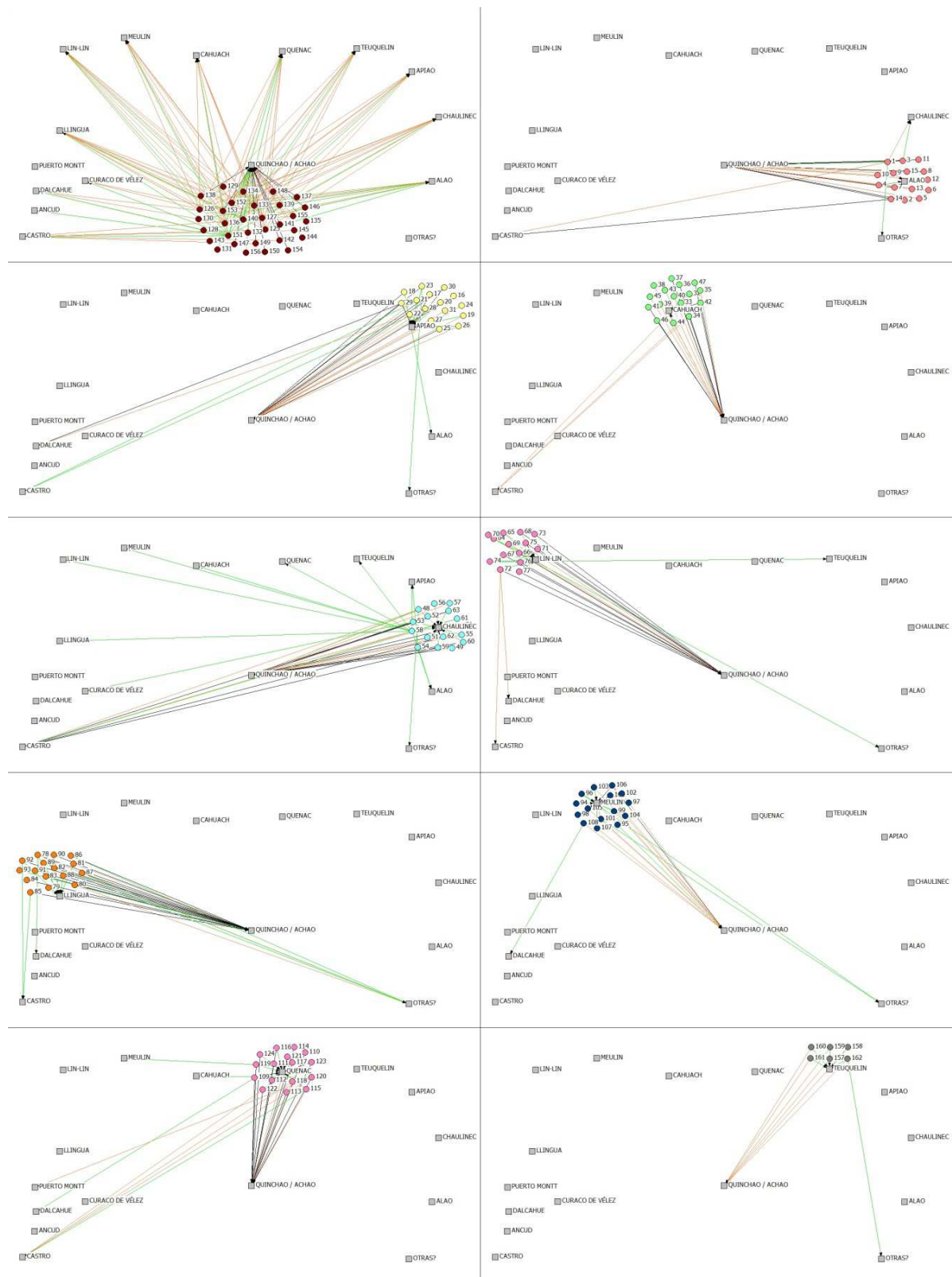
Given these and other characteristics of QAS, we can establish a clear difference between urban and rural SSU. The communal capital Achao is the urban SSU, with its concentration of trading activities, service provision, and whose economic activities not only rely on maritime-coastal or land resources since other activities as private business, construction, education or health care are equally or more important than fishing, algae harvesting or agriculture. Rural SSU include all remaining islands, in which islanders survive mainly through more traditional and resource-based activities such as agriculture, livestock, fishery, diving and seaweed recollection, and who maintain dependence on Achao as a supplier of goods and services.

Figure 2: Economic socio-spatial relationships in Quinchao. Linkages: orange=buying / Green=selling / black=both buying and selling.



Results from Social Network Analysis highlight some interesting relational patterns between rural SSU and among rural and urban SSU. As shown in [Figure 2](#), Achao concentrates much of the economic socio-spatial relationships, serving as both a supply and trading centre. In the picture elaborated by NETDRAW software, you can identify respondents (coloured circles) and the types of relationships (lines of different colours) that they declare with SSU (gray squares). To facilitate interpretation, respondents have been positioned near their SSU of residence. QAS socio-spatial network reflects the dependence of rural SSUs towards Achao and a kind of isolation among rural SSUs. Trading within the socio-spatial network largely refers to the flow of coastal, marine and agricultural resources among islanders, and implies: a) purchase and sale within the same island inhabited by the surveyed, b) purchase and sale in Achao, c) sale in other villages or cities. Purchase and sale in Achao involves the displacement of rural SSU residents to the communal capital to stock up on groceries and fuel, and selling seaweed and selling crafts, whilst selling in other nearby localities mainly involves delivering hake and conger eel in near marine fishing grounds (see [Figure 3](#)).

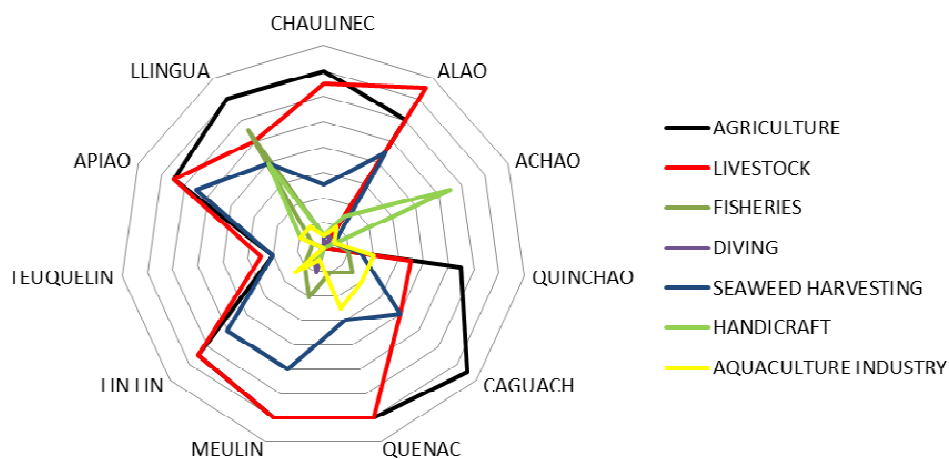
Figure 3: Economic socio-spatial relationships in Quinchao separated by islands.



Regarding other types of socio-spatial relations between islanders and islands within QAS, qualitative data also highlights disconnectedness. Perhaps the only exception are some religious rituals, particularly the “Nazareno de Cahuach” celebration that dates back at least 250 years, when the inhabitants of five islands of Chiloé (Cahuach, Alao, Chaulinec, Apiao and Tac) decided to put an end to their conflicts and acquired an image of Jesus from a Spanish priest as a symbol of their reconciliation. To decide on which island the image would stay, a competition of traditional rowing boats was organized which was won by representatives of the island of Cahuach. Since then, every August 30, Catholic pilgrims, merchants and journalists from around the country gather in Cahuach to perform religious rituals such as Mass or parades. What is relevant to this research is that, despite the massive pilgrimage, there appear to be few and weak links between the inhabitants of the different islands. For example, there are houses built in the same area of Cahuach where the inhabitants of each visting island stay overnight; Alao’s pilgrims stay in one house, Achao’s pilgrims in another, and so on. Either way, it is an extraordinary event that occurs once a year (or twice, considering that a similar event is held in summer, but mainly for foreign tourists).

Now is the time to briefly depict features of the cornerstone economic activities that sustain livelihood in QAS, so we can then dig deeper into how islanders, activities, spaces, resources and patterns of mobility assemble and articulate in livelihood strategies in QAS. Rural SSU’s livelihoods are based on an economic repertoire that combines land work, algae harvesting, capture fisheries and industrial aquaculture. However, there are important differences within these, since their practice is not homogeneously distributed in each rural SSU. [Figure 4](#) shows the results of the main activities within the economy and includes terrestrial practices since livelihood strategies depend precisely on sea-land complementarity.

Figure 4: Distribution of economic activities among Quinchao's islands.



Agriculture and livestock in QAS account for much of the local subsistence economy; its practice allows domestic consumption and trading in Achao, therefore generating small but significant amounts of rural revenue. But, despite their domestic importance, ethnographic information suggests a loss of ‘commercial association’ over the years, perhaps because agriculture and livestock are mainly meant for domestic consumption, and not market exchange. This loss of commercial association will be crucial in further analysis and discussion, suggesting how land and sea interplay assemblages in emergent differentiated landscapes. We will return to this point later.

Seaweed harvesting is the more prominent coastal activity, especially by its trade orientation. This practice focuses on three species: *luga roja* (*Gigartina skottsbergii*), *luga negra* (*Sarcothalia crispata*) and *pelillo* (*Gracilaria chilensis*) that can only be commercialized in summer. Algae are a core business for archipelago residents, at least for rural SSUs, since their marketing provides much of the income that the islanders obtained and distributed throughout the year. Their importance is such that it has been the key factor that has triggered the application of Management and Exploitation Areas of Benthic Resources (AMERBs), especially to protect intertidal zones (where algae is harvested) from residents of neighbor islands and other nearby villages. In Chile, access to coastal areas is not restricted and therefore fishermen tend to protect their algae recollection areas by both local institutions and AMERBs. In the QAS, there are only two initiatives, led by the fishers unions of Llingua, aiming to establish a more formal regulation of these intertidal zones, in which residents have divided the beach among members for the purpose of allocating spatial and temporal rights to access algae areas, albeit these are still verbal agreements without strong local institutional foundations. In the remaining islands, access is not restricted, generating suspicions in some islanders who have been grouped to ensure the request of AMERB and secure coastal areas for entry of algae. However, the experiences associated with AMERBs have utterly failed: of all existing AMERBs, none is currently operating and ethnographic information indicates a high degree of organizational conflict triggered by the request of this fishery figure of administration. This increasing organizational and inter-organizational conflict is caused mainly by competition for access to good coastal areas (with two or more fisher organizations requesting the same coastal zone to implement one AMERB, increasing pressure over the zone and between organizations), or by inequalities between organizations that have united to request one AMERB (i.e. when one fisher organization becomes a free rider [Ostrom, 1990] and does not provide the same quantity of capital for financing the AMERB as the other organizations with which they have partnered).

Another sea-related activity is fishing. Diving is almost a nonexistent practice, but capture fishery is present and relevant but concentrated on one island: Llingua, the ‘island of fishers’ as it is known in QAS. Here, fishery concentrates in demersal species such as southern hake (*Merluccius australis*), golden conger (*Genypterus blacodes*), snook (*Eleginops maclovinus*) and stingray (*Raja spp.*). In the other nine islands, the only other business ‘on the water’ is industrial aquaculture (we exclude seaweed harvesting since this is done in the intertidal zone, and does not imply fishing operations on vessels). Extractive fishing in Llingua also shares characteristics with the demersal fishing conducted in other towns in southern Chile (Hidalgo, Ther and Saavedra, 2013), such as decreasing biomass of fish, vulnerability to phenomena such as Patagonian toothfish (illegal sale of fishing quotas allocated to each vessel by the National Undersecretariat of Fisheries), and a dependence upon intermediaries for negotiating the price of fish, among others.

The last prominent economic activity to note is industrial aquaculture. According to the National Undersecretariat of Fisheries, there are over 44 aquaculture concessions within the commune. This fact cannot go unnoticed, since they are located near the islands from where you can see many of the fish-farming centres, altering significantly the views or visual landscapes from the islands to the sea. The salmon aquaculture industry has large impacts on islander life, notwithstanding that it does not offer large quantities of direct jobs to local islanders because most of the workforce comes from elsewhere, mainly from the bigger cities of southern Chile. On average, only ten residents per island are directly employed by aquaculture centres to provide services as operators, cage cleaners and removers of discarded materials. These direct jobs are mainly reserved for male labour, whilst indirect jobs affect a wider population and mostly involve female labour in services like lodging and, in some cases, as operators within processing centres. Direct employability has prompted changes in islander livelihood strategies, through the incorporation of notions like salary, pre-established working hours, and hierarchical labour structures, among others.

The archipelago of Quinchao as an affordance socio-ecological system

As we have said before, our research utilizes an interdisciplinary and relational approach. One of its most important features is the use of socio-ecological theory to define and analyze the boundaries and properties of our archipelago system. A socio-ecological system (SES) is one where the two component systems, the social and ecological (or environmental), are interrelated, intertwined and have a co-evolutionary relationship (Berkes, Colding, & Folke, 2003; Gual, & Norgaard, 2010; Kallis, & Norgaard 2010; Plummer, 2000). The SES approach emerged as a critique to conventional scientific hypotheses that treated both component systems as discrete variables (Gunderson, & Holling, 2002). SES scientists have instead emphasized the relational aspects and the emergent properties of this complex system. Anthropologically, this approach rejects the culture-nature dichotomy (Ingold, 2000; Pálsson, 1996) and represents a convenient starting point for the constitution of a complex and post-normative science (Funtowicz & Ravetz, 1993). More recently, the link between SES theory and ecological anthropology has been noted, especially by Tim Ingold's proposal of a dwelling as a developmental system (Ingold, 2000).

This is how the *affordance* concept enters the scene: as an epistemological relationship between a subject and his /her environment and as opportunities for dwelling, similar to what we may call the enabling property of a subject-environment system. In psychology, Gibson (1979) addressed the perception issue in a similar way, attacking the computational analogy of the mind and defending the idea of a whole human being – mind and body – as an organism of its environment and, thus, as a direct function of how that person acts in the world; this epistemological relationship Gibson called “affordance” (Good, 2007; Reed, 1991). To Ingold (1996), this concept of affordance also highlights a critique of the concept of representation and its implicit idea of an external world that the mind just captures. Affordance, as well as SES, chart a way to overcome the ‘nature-culture’ dichotomy that has framed scientific possibilities over time and provide a new way in which the social sciences can face socio-environmental continuities.

Now, a fundamental question arises: how can these ideas be assembled for the Quinchao archipelago case? Vannini and Taggart (2012; 2013), suggest a path by addressing the analysis of archipelagic systems and highlighting Ingold's dwelling theory as a frame for analyzing embodied knowledge. In these two articles, the authors address sensory and

kinesthetic experiences of everyday life on an isolated island, disconnected from a supply of electricity and land routes for terrestrial connection with the mainland. Vannini and Taggart present an ethnographic description-interpretation inspired by Ingold's idea: that these places acquire their characteristics through the embodied practices of their inhabitants,

... a place is what its place-makers – humans or non-humans – do ... my argument is that sense of island place, or islandness, is an outcome of what islanders do, and in particular of how islanders move (Vannini, & Taggart, 2012, p. 228).

Thus, different people or groups of people dwell places in different ways, something that may be interpreted as “taskscape” or the result of landscapes shaped by embodied practices (tasks) that are developed in an environment (Ingold, 2000; 2011). As the reader may have anticipated, there are strong links between dwelling, affordances and SES theory and they all share an epistemological-theoretical background called the human-in-ecosystem approach (Davidson-Hunt, 2003, p. 70).

The results of our ethnographic research also revealed the affordance process of dwelling in Quinchao archipelago as a socio-ecological system. Dwelling in Quinchao implies an embedded knowledge of livelihood activities which produce differentiated landscapes, as discussed below. As Quinchao is an archipelagic system formed by ten islands administratively united in a commune, dwelling is mainly established through socio-spatial relationships between inhabitants and the rest of Quinchao's islands. Hence, dwelling in QAS implies the socio-spatial kinesthetic and the sensorial experiences of activities realized in every different place of the archipelago (houses, one's island, others' islands, boats, local markets), but also in the sensorial experiences of performing these activities in a particular climate, and the environmental knowledge individually and socially constructed and collected through language, among other important dimensions of dwelling on an island. The vigorous growth of the salmon aquaculture industry also radically transformed the knowledge and experiences related to pollution in both the water column and the seabed (mainly chemicals), as with waste accumulation on every beach (mainly plastic material). Therefore, the transformation in movements and practices is also a transformation in knowledge and in this case includes collective perceptions about these new risks. Another example is the transformation in socio-spatial relationships between the inhabitants of the different islands of the archipelago, particularly in relation to the hub role played by the archipelago's capital Achao. For at least three decades, Achao has strengthened its administrative and economic power within the socio-spatial network of the archipelago, resulting in the destruction of historical sub-networks or relationships among all other islands. In the language of social network analysis, Achao has become the hub of a socio-spatial free-scale network through preferential connections (Barabási, 2012; Barabási, & Albert, 1999). In this way, a small island of the archipelago of Chiloé has become the main island of the archipelago of Quinchao, in line with the principles of fractality (Baldacchino, 2008, p. 47; Dahl & Depraetere, 2007, p. 64). As we will argue below, these characteristics of dwelling are just as artificially and heuristically divided in terms of another keystone of the human-environmental island experience: livelihood strategies.

The Quinchao archipelago system as a scenario of livelihood strategies

The analysis of Chilean southern islands can be enriched from the approaches proposed by economic anthropology, even in its most conventional forms. There have been diverse

criticisms of the wholesale application of neoclassical economic principles to every economic activity (Polanyi 1976; 2004). As we suggest in this paper, the economy is not just a maximizing cost-benefit calculation but a relative and localized way of organizing social subsistence. Even while posturing as dominant and universal, capitalism only constitutes a particular and historical expression of the economic process itself (Gudeman and Rivera, 1990). Economic practices have many expressions, all of which must be located and nested in cultural time. From this perspective, all models for the interpretation and explanation of the economy as cultural configuration assume porous compositions or hybrid edges, where different meanings and symbolizations co-exist, ordering material life. Moreover, any socially situated system of production, exchange (distribution) and consumption is also a system of (production of) meanings.

This theoretical and epistemological position has been endorsed by fieldwork in Quinchao and those parts of southern Chile where we have secured ethnographic records. Our goal was to move away from pure models of economies and societies understood under discrete categories (centralized *or* capitalist economies; modern *or* traditional societies; urban *or* rural lifestyles), admitting a complexity that must be observed and analyzed systematically, while also taking into account global and emergent properties of social systems that exceed these dichotomous categories. We will use the concept of ‘cultural economics’ to refer to the re-definition of the economy from this point of view, and the concept of ‘livelihood strategies’ as cognitive and material processes of social and environmental appropriation to ensure social reproduction (Florido del Corral, 2007).

Under these considerations, the reproductive systems of material life in the Quinchao (or Chiloé) archipelago are inscribed in institutional settings whose characteristics cannot be reduced to global market forces or their expansive dynamics. We can distinguish between livelihood strategies in the city of Achao (with a much more urban and service-oriented economy) and strategies of the inhabitants of the other islands, more closely related to consumption or trading elements of the flora, fauna and abiotic resources (what is usually called exploitation of natural resources or primary economy). In the latter case, every island features a unique combination of agriculture, livestock, seaweed harvesting, fishing and aquaculture. In this picture, the salmon aquaculture industry and AMERBs have generated changes in the weighting of economic repertoires on each island, producing two types of livelihood strategies within the archipelago: coastal economies (where the collection of seaweed and AMERBs is key) and maritime economies (where aquaculture dominates). Our analysis is particularly concerned with how different economic practices (processes of production, distribution and consumption of goods and services) are intertwined with specific symbolization of space and resources. Before doing so, we look at maritime and coastal landscapes and how they have been impacted by the effects of aquaculture and AMERBs.

Quinchao as landscape of affordance

Landscape has become a key topic in socio-environmental research over the last decade. According to Urquijo & Barrera (2009), as early as the 19th century, the concept of landscape began to be appropriated by science (mainly by geography, space modeling and socio-environmental sciences), and abandoned the exclusive domain of art (such as landscape painting, naturalistic poems and travel chronicles). Landscape has been inextricably linked to the idea of space which, to Lindón, Aguilar & Hiernaux (2006), refers to its anthropogenic production according to its etymological roots (the Greek *spatium* and German *raum*).

A historical frame proposed by Fernández (2006) identifies different periods of landscape research, ranging from quantitative (landscape metrics) to qualitative (semiotic landscape) poles. By the 1930s, one of these approaches became highly influential under the leadership of Carl Sauer, who believed in what he called ‘cultural geography’, devoted to the description of visible landscapes formed by natural and cultural elements. In one of his most popular and influential articles (also called “Cultural Geography”, 1931), he stated that every human (visible) trait over the landscape should be an object of inquiry as these represent evidence of adaptive processes in socio-environmental relations. This second period denies the plausibility of establishing positive laws between environment and society but also highlights landscape as historical subject, increasing the deployment of historic methods in research design (Mitchell, 2000; Sauer, 1925; 1931). Since the 1980s, a ‘new cultural geography’ has expanded Carl Sauer’s approach through an innovation: the definition of landscape as a complex socio-environmental construction (not just as mere evidence of social adaptation to an environment) and thus incorporating the symbolic or textual analysis of landscapes (Kramsch, 1999). This reinterpretation of the landscape underlines the importance of the perception and collectivization processes of abiotic, biotic and anthropic components of a particular space (Nogué, & Vicente, 2004).

The focus therefore now shifts to the approach that we believe can be useful to nissology: that of a new cultural geography which proposes a reweighting of the role of individuals and interpersonal communication in landscape shaping and emphatically rejected the super-organic conception of culture in post-Kroeberian social sciences (Kroeber, 1917).

In summary, the cultural turn adds the communicative dimension as an essential component of the landscapes and their socio-environmental continuum. Therefore, landscape can be re-defined as individual and collectivized perceptions of an environment that are established through socio-environmental relationships, amenable to capture by using the strategy of symbolic reading of communication processes and where Gibson’s “affordance” plays a key role between dwelling, livelihood strategies and the construction of these enabled perceptions.

In Quinchao, we used this framework to analyze how salmon aquaculture and AMERBs have led to changes in coastal and marine landscape formations, which also proved critical insights to the study of ‘terrestrial’ landscapes¹. Local perceptions explicitly associate transformations of marine-coastal landscapes to the loss of the commercial orientation of land-based activities, whilst this loss can be interpreted as a result of the political transformations of socio-spatial relationships inside QAS (especially due to the reduction of mobility and trade, and the strengthening of Achao as a supply hub). Terrestrial landscapes acquired a symbolism associated with daily life and disconnected from monetary incomes; for QAS islanders, spaces and resources of agriculture and livestock do not participate in the flow of commercial transactions. To be more faithful to the opinions of local islanders, the concept of “resource” is not employed to refer to animals or vegetables that are used as food, transportation, fertilizer, medicine or similar; they are part of a non-profit environment, such as weather or forests.

Coastal-maritime landscapes, on the other hand, were associated with “making money”; an example of a “capitalized nature” described by Escobar (2008), but with the exception that for Escobar every model of nature’s appropriation (organic, capitalist and

¹ Here, the concept of ‘terrestrial landscapes’ is not a tautology because it is critical to distinguish between terrestrial, coastal and marine landscapes. Another possibility would be to use the concepts of ‘seascape’ and ‘landscape’, but that would disadvantage coastal landscapes.

techno-ecologic) is associated with only one type of actor of the Colombian Pacific coast: indigenous, capitalist entrepreneurs and bio-diversity experts, respectively. The commerce of algae has made of the coastal zone a special place, one where global economic trends come across local territories. But salmon aquaculture and AMERBs established another distinction, this time between islands with coastal economic orientation and with marine economic orientation, respectively. To the first ones (where no fishing or aquaculture are part of the economic repertoire), the ocean is seen as a barrier that hinders island-island mobility and where fauna is not seen as resources or even as part of household economic practices; for the latter ones, salmon aquaculture has expanded the symbolization of monetary incomes from the intertidal coast to the sea.

Discussion: contributions to nissology and archipelago thinking

The outstanding challenges of nissology and archipelagos require, like every other complex problem, an interdisciplinary understanding, and we have tried to address this by combining ideas from anthropology, geography, ecology and psychology. The most relevant property of these ideas is that they all share a relational background that emphasizes relationships among different unities and across different spatial scales. SES theory, dwelling, affordance, cultural economy and landscapes, all point to the importance of relationships between humans, human activities, societies and ecosystems, societies and places, places and mobility, action and perception, among others. If being static is the main enemy, for Jonathan Pugh “archipelago thinking” is highly related to a “spatial turn” that pushed and aided social sciences to denaturalize place and space as fixed concepts,

Thinking with the archipelago denaturalizes space so that space is more than the mere backcloth for political or ethical debate. Instead, reflective of a spatial turn in thinking, it emphasizes more fluid tropes of assemblages ... mobilities, and multiplicities associated with island-island movements (Pugh, 2013, p. 10).

In our case study, the differentiated coastal and marine landscapes (as different symbolism associated with the sea as both space for connectivity and as foreground for economic activities) are examples of denaturalizing space and also making visible of other, apparently, unnoticed sources of socio-environmental linkages and landscapes. This idea resembles the notion of “aquapelagos” (Hayward, 2012a, 2012b). Hayward argues that the treatment given by Stratford and collaborators (2011) of the archipelago as a “terrestrial aggregate” (Hayward, 2012a, p. 2) is insufficient as it excludes the role of the sea as part of archipelagic identities. Aquapelagos are defined as,

an assemblage of the marine and land spaces of a group of islands and their adjacent waters” and as “a social unit existing in a location in which the aquatic spaces between and around a group of islands are utilized and navigated in a manner that is fundamentally interconnected with and essential to the social group’s habitation of land and their senses of identity and belonging (Hayward, 2012a, p. 5).

This kind of definition is thought by the author as a way to overcome a merely geographical description (Hayward, 2012b, p. 2) and to re-weigh the marine realm into archipelagic

constitution and in the marine-land continuum, particularly through such human action as agriculture, aquaculture and fisheries. Human activities in marine spaces as not just enablers of an archipelagic continuum, but also symbolizations of these spaces and the disruptions that can emerge from different kinds of symbolizations derived from differentiated social-ecological configurations. In other words, the notions of the sea as ‘fence’ or as an expanded field of human activity are both evidence of emergent cultural landscapes of dwelling an archipelago. Similarities with our work are clearer when Hayward uses Bruno Latour’s Actor-Network Theory, to argue that “While the human aspect is essential to the aquapelago, humans are only one of a series of actants without which the aquapelago cannot be performatively constituted.” (Hayward, 2012b, p. 3). This picture matches our archipelagic socio-ecological frame, where the archipelago is a complex system that features emergent properties (as the cultural landscapes of marine spaces) that are enabled by the interaction of their components (in this case, the archipelago’s inhabitants).

Several conclusions or lessons can be drawn from the QAS case. First, intensification of local-global assembling in local scenarios has sharpened the speed of transformations of SES. For example, their economic institutions have experienced the outcomes of the co-existence of actors with different socio-cultural heritages in harmonious or conflicting ways. In QAS, the spreading of salmon aquaculture and the weakening of small-scale fishery livelihoods depict this model. However, this still seems a very simple model for an issue that we have already defined as complex, so this simplicity is probably related to the usual use of discrete categories or the confusion between the institutional dimension of an economic practice and how it is internalized and collectivized in the inter-subjective world of social actors. This leads us to our second lesson: in this kind of empirical context, where two economic institutions so dissimilar co-exist, subjects do not internalize and collectivize these models linearly, but instead produce a constellation of different livelihood strategies which combine practices and symbolisms of both institutions.

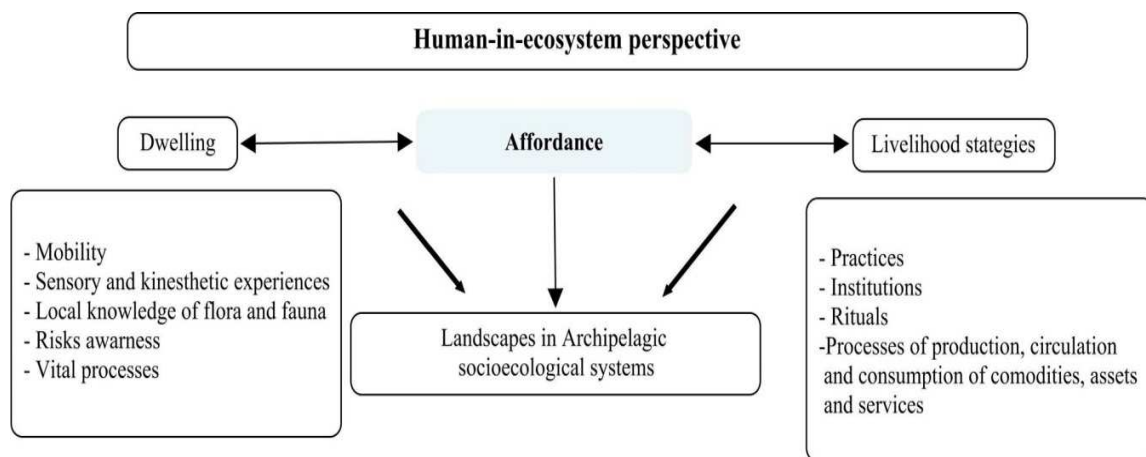
By no means is this something exclusive to Quinchao, but rather a feature of various small economies that help them to thrive in the modern global context, challenging the conventional ‘vulnerability’ thesis commonly used to think about small states or economies (Baldacchino & Bertram, 2009). Island studies literature is rich about this. For example, analyzing the Jamaican socio-economic spectrum, Lambros Comitas stated that using the term “peasant” is misleading for research since most Jamaican islanders are engaged in more than one economic activity (e.g. combinations of fishing, cultivation, carpentry and wage employment); this economic multiplicity increases complexity, because each islander can be part of one or more economic statuses (Comitas, 1973). This kind of economies of scope, characterized by diversification, flexibility and economic multiplicity (and as opposed to the strategy of hyper-specialization -"speciation"- of some islands' economies: Bertram & Poirine, 2007), has been recognized by other island scholars, especially in the abundant literature about the Caribbean (Carnegie, 1982, 1987; Frucht, 1967; Poon, 1990).

That is why, in the Quinchao market economy, principles and symbolisms were adopted and combined distinctly between island, maritime and coastal economies. In a linear model, this should not have happened because, let us remember, all these islands deploy what is usually called a ‘traditional’ economy, and hence they should have responded similarly. But that was not the case, because the specific sociocultural, sociopolitical and ecological features of each island and their role within the socio-spatial network of the archipelago, has forced them to adopt specific and distinct livelihood strategies. This interpretation of global-local dynamics intersected in Quinchao can be of some utility to outline, at least roughly, answers to

some important nissological inquiries. When Peter Hay asks whether islands and archipelagos can be associated with vulnerability or resilience, the QAS provide some evidence that they can be both, depending if and how islanders are capable to adaptively assemble economic activities from different provenance, e.g. like Llingua's fishers who can practise fishing, algae harvesting, agriculture, livestock (the more traditional livelihood practices) and take advantage of aquaculture industry benefits (a trans-national activity recently established in Quinchao). Ingold's dwelling perspective and cultural economics can provide theoretical backgrounds to Hay's debriefing.

The island singularities that we have mentioned may correspond to some of the concerns for islands 'on their own terms' articulated by island studies scholars, and are plotted in [Figure 5](#). Here, we present some of the key concepts named above and also provide a listing under "dwelling" and "livelihood strategies", enumerating some of the topics explored through qualitative and quantitative methods (in-depth interviews, ethnographic diaries, Social Network Analysis, Surveys and others): surely a still restricted list, assuming the limitless possibilities of archipelagic systems.

Figure 5: Theoretical frame for archipelagic studies.



Final considerations

Here rests the core of our ethnographic experience: the complexity of an archipelago system requires more than conventional scientific thinking. Archipelago thinking can and should be addressed by taking note of scientific innovations guided by interdisciplinary endeavours. Key features of our scientific model outline, which we are keen to re-iterate, include the following: 1) the co-evolutionary relationship between social and environmental systems, rarely treated as a complex system with emergent properties, and which also allows the use of the concept of "affordance" to adequately articulate the scalar difference between subjective perceptions and emergent global properties of a socio-ecological system; 2) the theoretical and ethical importance of studying patterns of local economy, and their symbolic peculiarities and dynamics, in the context of global-local frameworks of current modernization and globalization; and 3) the key role of interpersonal communication about environment perceptions and spatial mobilities.

Nissology and archipelago thinking entail a rich ethnographic documentation; yet they eschew formal theoretical modeling; a fact which can perhaps be attributed to the youthfulness of both areas of inquiry. We do not anticipate that the scientific community will embrace the idea of theoretical modeling of ethnographic or empirical research. However, we believe this is the type of work can significantly contribute to deepening the problematization and analysis of island studies. It certainly would not jeopardize nissology and its axiological task of studying islands on their own terms; and it could actually serve to improve our analytical understanding by highlighting various properties of archipelagic systems.

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